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EXAMINER	
KINGAN, TIMOTHY G	

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1772	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/580,024	LUDEMANN ET AL.	
	Examiner	Art Unit	
	TIMOTHY G. KINGAN	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 May 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23,25,29 and 30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23, 25, 29 and 30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/26/2010 has been entered.

Response to Arguments

1. Applicant's arguments filed 09/29 have been fully considered but they are moot in view of a new grounds of rejection. However, examiner addresses such arguments in order to provide additional and alternate explanation of the rationale for the combination of references made in this office action.

Abramson teaches that metabolites of an externally supplied precursor may be labeled to uniformity/ saturation. Such teaching is acknowledged in the declaration provided under 37 C.F.R. § 1.132. Further, as stated in previous office actions, Lee teaches "The precursor molecule can be any molecule which normally contains a ^{12}C. Further, 1, 2, 3, 4, 5, 6 or any number of ^{13}C labels can be included within the precursor molecule. An example of a precursor molecule typically utilized in connection with the invention is a glucose molecule." Such teaching suggests, and it would be obvious to

one of ordinary skill in the art of metabolic studies, the step of using uniformly labeled glucose in the method of labeling metabolites. Together with the teaching of Lee comprising liquid or gas chromatography interfaced with mass spectrometry, the resolution of which may be 1 Dalton or less, the references teach or suggests the elements of applicant's method.

The Supreme Court in *KSR* identified a number of rationales to support a conclusion of obviousness which is consistent with the proper "functional approach" to the determination of obviousness as laid down in Graham. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395-97 (MPEP 2141). The key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in *KSR* noted that the analysis supporting a rejection under 35 U.S.C. § 103 should be made explicit. The Court, quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), stated that "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" *KSR*, 550 U.S. at___, 82 USPQ2d at 1396 (MPEP 2141).

Exemplary rationales that may support a conclusion of obviousness include: Combining prior art elements according to known methods to yield predictable results, otherwise known as rationale A (MPEP 2141). The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination

yielded nothing more than predictable results to one of ordinary skill in the art. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395; *Sakraida v. AG Pro, Inc.*, 425 U.S. 273, 282, 189 USPQ 449, 453 (1976); *Anderson 's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 62-63, 163 USPQ 673, 675 (1969); *Great Atlantic & P. Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152, 87 USPQ 303, 306 (1950). "[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR*, 550 U.S. at ___, 82 USPQ2d at 1396. If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art (MPEP 2143).

In the instant application, the steps of the method are taught by Abramson and Lee. The method of analysis taught by Abramson, CRIMS, may be substituted by the method of Lee comprising chromatography interfaced with a mass spectrometry for ratio analysis of isotopomers, and the advantages would be obvious to one of ordinary skill in the art seeking to identify the metabolites of an externally supplied precursor. These considerations are made in response to applicant's arguments and the declaration provided under 37 C.F.R. § 1.132.

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. **Claims 1-13, 15, 20-22 and 30** are rejected under 35 U.S.C. 103(a) as being unpatentable F.P. Abramson and P. Lecchi, U.S. Patent Application Publication 2003/0077572 (herein after Abramson) in view of W-N.P. Lee and L.G. Boros, U.S. Patent Application Publication 2003/0180710 (herein after Lee).

For Claims 1, 7, 8, 10, 13 and 30, Abramson teaches uniform labeling of cells provided with essential amino acids or glucose as a sole source of carbon, such carbon source comprising an excess amount of its minor isotope ^{13}C (the isotope is ^{13}C) to produce uniformly and completely labeled cellular products (at least 50% of the metabolites of the biological sample to be analyzed contain the isotopic label) which can then be processed [0016] (sample derived from cells maintained under conditions allowing the uptake of an isotopically labeled and metabolizable compound so that metabolites are saturated with the isotope of the label; metabolizable compound is U-^{13}C-glucose).

Abramson does not teach the step of analyzing metabolites or determining the relative quantity of metabolites from samples which differ by their isotopic label. Instead, Abramson teaches the step of analysis by a process including fractionation, e.g., by chromatographic procedures such as HPLC [0030], analysis of co-eluting compounds (fractionating or purifying so the sample contains a subset of metabolites) by CRIMS (chemical reaction interface mass spectrometry) or alternative form of monitoring [0025] and electrospray mass spectrometry [0031]. However, such step of determining metabolites is known in the art of stable isotope labeling, HPLC fractionation and identification by mass spectrometry. Lee teaches methods for determining metabolic

processes associated with glucose metabolites (abstract) in which precursor ^{13}C labeled glucose containing any number of ^{13}C labels [0073] are provided to cells in culture for the purpose of creating a profile of metabolic pathway flow [0017] and analyzing the stable isotope labeled metabolome [0028] by producing intermediary metabolites from labeled precursor [0089]. Lee also teaches mass isotopomers of these metabolites can be separated (fractionated or purified) by liquid and gas chromatography (metabolites are chromatographically separated prior to quantitative determination) and then measured and quantified by mass spectrometry procedures [0032], including MALDI-TOF [0036] (determining the relative quantity of metabolites which differ by their isotopic label). It would have been obvious to one of ordinary skill in the art to use an analysis of isotopomers of metabolites, chromatographically separating the sample in order to reduce its complexity, according to the teaching of Lee and with reasonable expectation of success, in analysis of the combined cultures of Abramson, in order to provide a method for positive identification of metabolites attainable by analysis such as HPLC-MS that leaves metabolites intact, thereby permitting their identification by reference to databases indexed by masses of metabolites.

Further for Claim 1 and for Claim 11 with regard to the quantitative determination of metabolites, Abramson teaches isotope ratio monitoring to achieve quantitative differential display (title), but does not specifically teach quantitative determination of metabolites. However, Lee teaches that isotopomers labeled by glucose substrate isotopes can be quantified by LC/MS methods (metabolites are quantitatively determined by mass spectrometry).

Further, Lee teaches that stable isotopes are used as standards for quantification of known compounds. It would have been obvious to one of ordinary skill in the art to provide for quantitative determination of metabolites, according to Lee (such as by use of stable isotope-labeled metabolite, incorporated with sample as internal standard and measured by isotope dilution, also taught by Lee, [0013]) in the method of Abramson and Lee, in order to improve the predictive power of chemical or genetic intervention in metabolome studies directed toward understanding the physiology of plant or animal cells.

Abramson does not specifically teach the number of metabolites labeled by the metabolizable compound. However, the production of such number, or more, appears to characterize the result of the labeling, but does not provide a specific step of the method. Further, since Abramson teaches uniformly and completely labeled products (labeling to saturation, i.e., at least 80% of all isotopes of the element in the metabolizable compound is label isotope), it would have been obvious to one of ordinary skill in the arts of cellular metabolism, that at least 50 metabolites of the metabolizable compound would be so labeled.

For Claims 2-4, Abramson teaches the step of growing cultures of cells in parallel using media that differ in the isotope ratio of, for instance, $^{13}C/^{12}C$, the cells grown for sufficient time to achieve isotopic equilibrium with the growth medium [0026]. Abramson teaches one set of cells comprises cells grown under conditions of pharmacological, chemical or physical stimulation or else a variant, such as genetically modified or diseased cells (a phenotypic state; a diseased state or different stages of pathogenicity)

grown to achieve uniform labeling with stable isotope such as 13C-labeled metabolite precursor [0026] (the first biological sample), while a second set of control cells are grown under non-labeled conditions (with ^{12}C precursors) [0022] (the second biological sample in which metabolites are not isotopically labeled or isotopically labeled differently from the first biological sample). Abramson teaches the step of combining such control and isotopically labeled cells [0028] prior to analysis by a process beginning with fractionation, e.g., by chromatographic procedures such as HPLC [0030] interfaced with an electrospray mass spectrometer [0031].

For Claim 5, Abramson and Lee do not specifically teach the number of metabolites which are quantitatively determined. However, it would have been obvious to one of ordinary skill in the art, from the teaching of Lee on the number and complexity of metabolic pathways accessed by labeling with ^{13}C-glucose, to monitor and quantify at least 50 metabolites, in the method of Abramson and Lee, in order to provide a method capable of revealing defects in the maximum number of enzymatic pathways.

For Claim 6, Abramson does not teach the identities of specific metabolites labeled with stable isotope. However, Lee teaches methods for determining metabolic processes associated with glucose metabolites (abstract) in which precursor ^{13}C labeled glucose, labeled at specific positions (abstract) or containing any number of ^{13}C labels, up to labels at all carbons (6 atoms of ^{13}C; U-^{13}C-glucose) [0073], is provided to cells in culture (allowing uptake of stable isotope) for the purpose of creating an information profile of metabolism including metabolic pathway flow, specific metabolite synthesis patterns, rate of metabolite synthesis, contribution of individual synthetic reactions

[0017] and analyzing the stable isotope labeled metabolome [0028] by producing intermediary metabolites from labeled precursor, including sugar phosphates, metabolites of the pentose cycle, glycogen, TCA cycle intermediates, glycolytic intermediates and fatty acids [0089]. It would have been obvious to one of ordinary skill in the art to include such classes of metabolites in analysis by the method of Abramson and Lee in order to advance the goal of determining the metabolome associated with metabolic precursors, according to the teaching of Lee.

For Claim 9, Abramson does not specifically teach use of yeast or plant cells, but teaches the labeling could be done with cells of any living species, including animal or human [0015]. However, use of plant cells in such experiments is known in the art. Lee teaches that stable isotope labeling studies may be done with any type of prokaryotic and eukaryotic cells, including plant cells [0067]. It would have been obvious to one of ordinary skill in the art to use plant cells with the labeling and quantitative determination of metabolites in the method of Abramson and Lee in order to identify components, including the relative amounts of the metabolome of plants, and, in so doing, advance an understanding of organisms important in agriculture.

For Claim 12, Abramson does not teach use of MALDI-TOF MS in quantitative determination of metabolites. However, use of such instrument is known in the art. Lee teaches that MALDI-TOF mass spectrometry for analysis of stable isotope labeled metabolites [0046]. It would have been obvious to one of ordinary skill in the art to use MALDI-TOF mass spectrometry, according to the teaching of Lee in the method of Abramson and Lee, in order to provide a robust method, capable of serial analysis and

with single Dalton resolution serving analysis of isotopomers. Further, one of ordinary skill in the art would have found desirable use of MALDI-TOF as an alternative to use of instruments with electrospray interfaces, since the former are generally considered more accessible to the novice user.

For Claim 15, Abramson does not teach the step of identifying one or more metabolites which are quantitatively determined. However, such capability in isotopomer analysis is known in the art. Lee teaches determination of the metabolic steps involved in the formation of any glucose-based metabolite in an organism, including TCA cycle and glycolytic pathway metabolites [0065] (identifying one or more metabolites which are quantitatively determined). It would have been obvious to one of ordinary skill in the art to identify metabolites which are quantitatively determined in order to determine the relative activities of enzymes in metabolic pathways originating from a precursor labeled with stable isotope.

For Claim 20, Abramson does not teach determining and analyzing one or more proteins and/or transcripts. However, such step associated with a quantitative method of isotopomer analysis is known in the art. Lee teaches use of ^{13}C-labeled precursor, in labeling cells in culture according to claim 1, and teaches measuring metabolic enzyme levels and their expression (transcript levels) as biomarkers for disease processes in follow-up to metabolome studies ([0017, Fig. 2) or DNA or RNA [0053] (transcripts). It would have been obvious to one of ordinary skill in the art to include determinations and analyses of proteins and/or transcripts in the method of Abramson and Lee, in order to extend the range of information gathered in disease processes or drug actions in those

processes and associated with clinical trials, thereby improving assessment of efficacy and safety, according to the teaching of Lee.

For Claim 21, Abramson and Lee do not teach determination of metabolites and proteins and/or transcripts from the same sample. However, Lee does teach use of labeled and treated cultures for metabolome studies (determination of metabolites) followed by proteomic or genetic studies ([0052, Fig. 2) (determination of proteins or transcripts). It would have been obvious to one of ordinary skill in the art to use the same cultures for metabolite and protein or nucleic acid studies in order to make most efficient use of cultured material as well as to provide an optimal basis for comparing and correlating results from metabolite studies with those from protein or nucleic acid studies.

For Claim 22, Abramson and Lee do not teach statistical evaluation of data. However, Lee does teach the relevance to and applications in metabolite monitoring for Phase I, II and III trials in getting approval from the FDA for treatments in new drug applications [0085]. It would have been obvious to one of ordinary skill in the art, from such suggestion of Lee, to use appropriate industry- and government agency-recognized statistical analysis of variance of data in order to provide a recognized basis for assigning levels of confidence to any conclusions based on the data, the results of such analysis potentially being critical in conclusions of efficacy.

4. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over Abramson in view of Lee as applied to claim 1, above, and further in view of S. Kasper, U.S. Patent Application Publication 2005/0112706 (herein after Kasper).

For Claim 14, Abramson and Lee do not specifically teach introducing external standards for one or more metabolites. However, Lee suggests such use in teaching that stable isotopes are also used as standards for quantification of known compounds [0013]. Examiner notes that once a standard is "introduced" into a crude or fractionated sample prior to analysis, it is commonly known as an "internal" standard (standard and sample metabolite intimately mixed), while an external standard is analyzed separately from metabolite in sample. The use of such standards is known in the art of quantitative mass spectrometry. Kasper teaches analysis of biologically relevant metabolites by MALDI-TOF-MS in which internal standards (external standard added to sample) is employed, the preferred such standard being a stable isotope labeled internal standard (isotopomers) [0055]. It would have been obvious to one of ordinary skill in the art to use the standards of Kasper in the method of Abramson and Lee in order to provide for correction of recovery in quantitative studies as well as to provide for isotopomers of metabolites that facilitate identification of sample metabolites based on detection of mass pairs.

5. **Claims 16 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Abramson in view of Lee as applied to claim 15 above, and further in view of C. Birkemeyer et al., J. Chromatography A 993:89, 2003 (herein after Birkemeyer).

For Claims 16 and 17, Abramson and Lee do not teach identification of metabolites by secondary fragmentation. However, such method of identification, made possible by predictable patterns of fragmentation in MS, is known in the art. Birkemeyer, teaches derivatization of phytochromes, including acidic compounds, by silylation (p. 90, ¶ 4), fragmentation of such derivatives in MS and identification by comparison of measured m/z values with data found in the literature as well as in a commercial mass spectral library (p. 92, ¶ 9). Further, Birkemeyer teaches detection of fragments by GC-MS with electron impact ionization and monitoring of total or selected fragment ions (p. 93, ¶ 2). It would have been obvious to one of ordinary skill in the art to use derivatization and identification of selected derivatives by secondary fragmentation in MS, according to Birkemeyer and in the method of Abramson and Lee, in order to make use of established methods for preparation and analysis of metabolites that provide for increased sensitivity associated in part with increased volatility and, therefore, recovery of analyte in detection.

6. **Claims 18-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Abramson in view of Lee as applied to claim 1, above, and further in view of M.K. Hellerstein and R.A. Neese, Am. J. Physiol. Endocrinol. Metab. 276:1146-1170, 1999 (herein after Hellerstein-APEM).

For Claims 18-19, Abramson and Lee do not teach uptake of unlabeled compounds in cells cultured before or after in isotope labeled compound. Lee does teach that ^{13}C labeled compounds such as glucose may substitute for compounds which

normally contain ^{12}C isotope, in functioning as precursors added to a changing test system, such as cells in culture [0083]-[0084]. The sequential exposure of cells to labeled and unlabeled compounds, in vivo or in vitro, with time-dependent measurement of isotope in metabolites comprises a "pulse-chase" experiment and is known in the art. Hellerstein-APEM teaches such experiments with stable isotope for quantifying by mass spectrometry relative abundances of molecular species of polymeric isotopomers (abstract, Table 1) (metabolites). It would have been obvious to one of ordinary skill in the art, from such teachings of Hellerstein-APEM to use such sequential culture in the method of Abramson and Lee in order to provide the opportunity to obtain time-dependent estimates (kinetic) of turnover of metabolites. Further, the comparison of metabolite distribution following a "chase" period with the distribution before the chase (without uptake of unlabeled compound) comprises an inclusion of a data point at time 0 and would have been obvious to one of ordinary skill in the art as essential for meaningful and comprehensive kinetic determinations of isotope distribution.

7. **Claim 25** is rejected under 35 U.S.C. 103(a) as being unpatentable over Abramson in view of Lee as applied to claim 1 and further in view of M.K. Hellerstein, U.S. Patent Application Publication 2004/0081994 (herein after Hellerstein-'994).

For Claim 25, Abramson and Lee do not teach a kit comprising an isotopically labeled compound and a manual. Such kits are known in the art. Hellerstein-'994 teaches a kit comprising isotopically labeled precursor molecules and instructions (a manual) [0016] for use in biochemical methods for measuring synthesis and turnover of

molecular components (abstract). It would have been obvious to one of ordinary skill in the art to prepare a kit comprising one or more labeled metabolites, according to the teaching of Hellerstein-'994 and in the method of Abramson and Lee, in order to provide the convenience of premeasured and quantified reagents for use as internal standards as well as to provide established and tested protocols for use of such reagents.

8. **Claim 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Abramson and L.T. Evans et al., U.S. Patent 5,532,206 (herein after Evans).

For Claim 23, Lee teaches methods for determining metabolic processes associated with quantification of glucose metabolites in cells labeled with precursor ^{13}C labeled glucose (abstract) (a set of isotopically labeled metabolites that may be purified from cell extracts). Lee also teaches that stable isotopes are used as standards for quantification of known compounds [0013], and Abramson teaches uniform labeling of cells provided with essential amino acids or glucose as a sole source of carbon, such carbon source comprising an excess amount of its minor isotope ^{13}C (the isotope is ^{13}C), produce uniformly and completely labeled cellular products which can then be processed [0016]. Further, specific compounds labeled with stable isotopes (metabolites) are known in the art for use as internal standards for identification. Evans teaches stable isotope-labeled gibberellin GA1 (metabolite) and its use as an internal standard in quantifying GA1 in mass spectrometry, a metabolite of applied GA20 (col 20, lines 65-67). It would have been obvious to one of ordinary skill in the art from such considerations, including motivation provided in the teaching of Lee, to prepare a set of

labeled compounds, according to the teaching of Evans and representative of one or more (a set) of metabolites of an applied precursor in order to facilitate the process of identification of said metabolites from cell extracts by mass pairing in the process of detection and their quantification by use of known amounts of such standards in mixing with cell extracts. Together with the teaching of Abramson that metabolites may be labeled to saturation with stable isotopes and subsequently purified, the suggestion of Lee on use of stable isotopes as standards would make obvious to one of ordinary skill in the art the use of cells in preparation of isotope-labeled metabolites, cells providing a source of many such metabolites dependent on a means for the purification.

9. **Claim 29** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Abramson and Evans as applied to claim 23 above, and further in view of Hellerstein-'994.

For Claim 29, Lee, Abramson and Evans do not teach a kit of isotopically labeled metabolites. However, Hellerstein-'994 teaches a kit comprising isotopically labeled precursor molecules [0016]. It would have been obvious to one of ordinary skill in the art to include, in such kit, isotopically labeled metabolites representative of metabolic products produced in cells from external sources of isotope-labeled precursor, in order to facilitate the process of identification of precursor metabolites from cell extracts by mass pairing in the process of detection and their quantification by use of known amounts of such standards in mixing with cell extracts.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMOTHY G. KINGAN whose telephone number is (571)270-3720. The examiner can normally be reached on Monday-Friday, 8:30 A.M. to 5:00 P.M., E.S.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, In Suk Bullock can be reached on 571 272-5954. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TGK

/In Suk Bullock/
Supervisory Patent Examiner, Art Unit 1772